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ABSTRACT

To determine which of several variables best predict aggression in hyperactive children, 38 hyperactive first-, second-, and third-graders were assessed for 12 consecutive school days on 11 behaviors associated with aggression. Behavioral items on the criterion measure, the Daily Behavior Checklist, were summed and then averaged over the 12 days to produce a daily aggression score. Predictor variables included parents' marital conflict, deficits in sustained attention toward children, events during the mother's pregnancy and delivery, parental child-rearing skills, and neuropsychological factors. Daily aggression correlated .36 (13% of variance) with measures of marital and family discord, .40 (16% of variance) with attention performance variables, .57 (33% of variance) with neuropsychological variables, .53 (28% of variance) with prenatal and birth variables, and .54 (29% of variance) with parental variables. Because of the great number of neuropsychological variables, the authors warn that the correlation between those factors and daily aggression be interpreted with caution. The strongest predictor variables from each of the domains were combined in a final regression analysis. Among the strongest individual predictors were the mother's variable level of knowledge of behavioral principles, accidental jarring of the fetus during pregnancy, suspected birth complications, and intensity of the mother's punishment of the child. Preliminary results point to parental child-rearing habits as a potential factor in the existence of aggression in young children. It is suggested that events during pregnancy and delivery have an affect on aggression as well. (Author/RH)

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Differential Characteristics for Hyperactive Children High and Low on Aggression

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Efforts to find out more about the causes of hyperactivity have been hampered by the heterogeneity found in this population (Chess, 1960; Langhorne & Loney, 1979; Langhorne, Loney, Paternite, & Bechtoldt, 1976; Loney, Langhorne, & Paternite, 1978). For example, age of child is one factor which contributes to the behavioral variability. For the 295 studies of hyperactive children conducted between 1960 and 1979, the average age spread in samples was seven years, typically including children from ages 5 to 12. With this broad of a sampling of developmental levels, relationships among variables could be obscured.

Another factor which adds to variability among hyperactive children is the degree of interpersonal aggression, primarily directed at peers. In a recent study (Prinz, Connor, & Wilson, 1981), we found that in a sample of 76 first, second, and third graders who were exhibiting hyperactive behavior at school, approximately one third of the children were engaging in aggression at a rate high enough to distinguish them from their nonhyperactive peers. The other two thirds fell within the bounds of the normal control group, with some not reflecting any physical aggression whatsoever. Potentially important is the question of what might account for the wide variability found in hyperactive children with respect to aggression with peers. I would like to describe some preliminary results which pose some hypotheses about the origins of aggression in hyperactive children.

The purpose of the study was to determine which of several variables best predict aggression in hyperactive children. Aspects to be reported here include marital conflict, deficits in sustained attention, events during pregnancy and delivery, parental child-rearing skills, and neuropsychological variables. The findings are to be taken as preliminary: some supporting data in the study

have not yet been analyzed, and the results are subject to replication by other investigators.

The study sample was restricted to first, second, and third grade children in order to reduce variability due to age. Out of 80 children whose parents made contact, only 38 met the criteria of evidence of hyperactivity at home and at school, nonretardation, and willingness to take the child off medication during assessment.

The criterion measure was the Daily Behavior Checklist (Prinz, et al., 1981). Using the Daily Behavior Checklist for 12 consecutive school days, teachers tracked 11 behaviors associated with aggression, including "hit, kicked, or shoved a child", "argued in a mean way", "took something away from another child", and "destroyed someone else's property". Behavioral items were summed, and then averaged over days to produce a Daily Aggression score (internal consistency = .88).

To determine the extent to which the criterion of Daily Aggression could be predicted, multiple regression was conducted for each of the sets of predictor variables. The first was marital conflict variables. Porter and O'Leary (1980) reported a significant correlation between overt marital hostility and conduct problems in a clinically heterogeneous group of boys. Others, including Hetherington and Martin (1979) and Rutter (1971), have also provided support for an association between boys' conduct problems and marital discord. However, these findings have not been extended to a purely hyperactive sample. In this study, three measures of marital and family adjustment were used: the Locke-Wallace Marital Adjustment Questionnaire (Locke & Wallace, 1959), the Conflict Tactics scales (Strauss, 1979), and the O'Leary-Porter overt marital hostility scale (Porter & O'Leary, 1980). Collectively, the measures of marital and family discord only produced a multiple correlation of .36 with Daily Aggression,

which accounts for a mere 13% of the variance.

Similar results were obtained for attentional-performance variables. The tasks included the Picture Completion and Maze subtests from the WISC-R (Wechsler, 1974) and the auditory Continuous Performance Test (Douglas & Peters, 1979; Sykes, 1969). Multiple correlation with Daily Aggression was .40, accounting for 16% of the variance.

Neuropsychological variables seemed to be more related to the criterion. These variables included the PANESS test for soft signs (Camp, Bialer, Press, & Winsberg, 1977; Camp, Bialer, Sverd, & Winsberg, 1978; Holden, Tarnowski, & Prinz, in press), and selected items from the Reitan battery (Reitan, 1974) which have shown good discriminant validity (Tsushima & Towne, 1977). The multiple correlation with Daily Aggression was .57, accounting for 33% of the variance. Because of the greater number of variables in this analysis, the correlation should be interpreted with caution. Also, the pattern among the neuropsychological variables in this sample needs to be analyzed further.

Prenatal and birth variables included: accidents which jarred the fetus during pregnancy, amount of coffee-drinking by the mother, amount of smoking by the mother during pregnancy, amount of alcoholic consumption by the mother during pregnancy, amount of drugs (tranquilzers, stimulants, marijuana) taken during pregnancy, and maternal report of suspected birth complications (Wrede, Mednick, Huttunen, & Nilsson, 1981). A multiple correlation of .53 (accounting for 28% of the variance) was found.

Two measures of parental child-rearing were assessed. The first was a 50-item Knowledge of Behavioral Principles As Applied to Children test (O'Dell, Tarler-Benlolo, & Flynn, 1979) administered to the mother. The second was a measure of the intensity of punishment, used by Lefkowitz in a longitudinal study in which the highest intensities of parental punishment were associated

with child aggression (Lefkowitz, Eron, Walser, & Huesmann, 1977; Lefkowitz, Huesmann, & Eron, 1978). The parental variables produced a multiple correlation of .54 (accounting for 29% of the variance) with Daily Aggression.

The strongest predictor variables from each of the domains were combined in a final regression analysis. A multiple correlation of .65 (accounting for 42% of the variance) was obtained. The strongest individual predictor variables with Daily Aggression were:

Knowledge of Behavioral Principles	-.49***
Accident Jarring Fetus During Pregnancy	.38**
Suspected Birth Complications	.33**
Intensity of Punishment (mother)	.28*
Errors, Finger-Tip Symbol Writing Recognition for Nondominant Hand (Reitan Battery)	.27*
Picture Completion (WISC-R)	-.26*

(*$p < .05$ **$p < .01$ ***$p < .001$)

Three other analyses of this data set are currently underway: (1) observation of parent-child interaction; (2) analysis of birth delivery records; and, (3) a cluster analysis of the group of children to begin to identify subgroups. These analyses will aid in the interpretation of the preliminary results.

Nonetheless, the preliminary results point to parental child-rearing habits as a potential factor in the ontogeny of aggression in young hyperactive children. There is also a potential effect of events during pregnancy and delivery which suggests a potential link between organicity and aggression in this population. Whether the pregnancy-delivery and parenting variables are pointing to the same or different children will be answered in part by the cluster analysis.

Given that aggressive habits show some degree of continuity over child-

hood (Lefkowitz et al., 1977; Olweus, 1979), it is recommended that early behavioral, environmental, and biological antecedents be identified. The identification of antecedents of aggression in young hyperactive children may provide some clues about how to proceed with early intervention and prevention.

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